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# Washington Basin Outlook Report

## January 1, 1994



# **Basin Outlook Reports**

## **and**

## **Federal - State - Private**

## **Cooperative Snow Surveys**

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### **How forecasts are made**

Most of the annual streamflow in the Western United States originates as snowfall that has accumulated high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points.

Precipitation, temperature, soil moisture and antecedent streamflow data are combined with snowpack data to prepare runoff forecasts. Streamflow forecasts are coordinated by Soil Conservation Service and National Weather Service hydrologists. This report presents a comprehensive picture of water supply conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data, and narratives describing current conditions.

Snowpack data are obtained by using a combination of manual and automated SNOTEL measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation and temperature are monitored on a daily basis and transmitted via meteor burst telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

Forecast uncertainty originates from two sources: (1) uncertainty of future hydrologic and climatic conditions, and (2) error in the forecasting procedure. To express the uncertainty in the most probable forecast, four additional forecasts are provided. The actual streamflow can be expected to exceed the most probable forecast 50% of the time. Similarly, the actual streamflow volume can be expected to exceed the 90% forecast volume 90% of the time. The same is true for the 70%, 30%, and 10% forecasts. Generally, the 90% and 70% forecasts reflect drier than normal hydrologic and climatic conditions; the 30% and 10% forecasts reflect wetter than normal conditions. As the forecast season progresses, a greater portion of the future hydrologic and climatic uncertainty will become known and the additional forecasts will move closer to the most probable forecast.

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# Washington Water Supply Outlook

January 1994

## General Outlook

Forecasts for 1994 runoff vary from 90% of average for the Kettle River to 72% for the Naches River. Fall precipitation was much below normal, with most of the state receiving below 50%. December precipitation was 82% of normal statewide. It varied from 106% of average in the Colville - Pend Oreille Basin to 61% in the White - Green Basin. Year-to-date precipitation varies from 50% in the Walla Walla to 68% in the North Puget Basin. The snowpack varies from 81% in the Cowlitz - Lewis Basin to 57% in the Walla Walla Basin. Washington SNOTEL sites averaged 78% of the normal snowpack for January 1 (By January 9, the statewide average was 87%). December temperatures were above normal and varied from one degree above in the White-Green Basin to six degrees above in the Okanogan Basin. Streamflows varied from 100% of normal on the Kettle River to 24% on the Naches River. January 1 reservoir storage is generally poor throughout the state, with reservoirs in the Yakima Basin at 9% of average and 17% of capacity.

## Snowpack

The January 1 SNOTEL reading showed the snowpack to be 78% of average. Snowpack varied over the state, with the Walla Walla River Basin the lowest with 57% of average, and the Cowlitz-Lewis and Yakima Basins at 81% of normal. The North Puget River Basins had 70% of average. Snowpack along the east slopes of the Cascade Mountains included the Yakima with 81%, and the Wenatchee 76%. Snowpack in the Okanogan was at 73%, and the Spokane Basin had 77%. Maximum snow cover was at Morse Lake SNOTEL near Mount Rainier, with a water content of 18.3 inches. This site would normally have 19.1 inches of water content on January 1.

## Precipitation

December precipitation reported from National Weather Service stations was 82% of average statewide. The year-to-date precipitation statewide is 58% and it varies from 50% of normal in the Walla Walla Basin, to 68% in the North Puget Basin. December precipitation varied from 106% of average in the Colville - Pend Oreille Basin, to 61% in the White - Green Basin. SNOTEL sites in Washington showed high elevation year-to-date precipitation values to be 64%. Maximum year-to-date precipitation was at the June Lake SNOTEL site near Mt. St. Helens, with 38.8 inches since October 1, 1992; normal for this site is 55.4 inches.

## Reservoir

Reservoir storage in Washington was generally below average for January 1. Below normal carryover in the Yakima Basin, cold weather during November and a dry fall has reduced the streamflow entering the reservoirs. Reservoir storage in the Yakima Basin was 97,700 acre feet, 9% of normal. Storage at other reservoirs included Roosevelt at 98% of average, and the Okanogan reservoirs, a bright spot, at 129% of normal for January 1. The power generation reservoirs contain the following: Coeur d'Alene Lake, 60,500 acre feet, or 46% of normal; Chelan Lake, 344,700 acre feet, 91% of average and 51% of capacity, and Ross Lake at 134% of average, and 75% of capacity.

## Streamflow

Forecasts for summer streamflow are for below-to-near average and vary from 90% of average for the Kettle River to 72% of normal for the Naches River. January forecasts for some west side streams include: Cedar River, 82%; Green River, 75%; and the Dungeness River, 84%. Some east side streams include the Yakima River at Parker, 75%; the Wenatchee River, 74%; and the Colville River, 80%. December streamflows were below average in Washington. The Kettle River at 100% was the highest and the Naches River with 24%, was the lowest in the state. Other streamflows were the following percentage of normal: the Cowlitz River, 47%; the Okanogan River, 84%; the Spokane River, 47%; the Columbia at the Canadian border, 88%, and the Yakima River at Kiona, 48%.

# Interpreting Streamflow Forecasts

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## Introduction

Each month, five forecasts are issued for each forecast point and each forecast period. Unless otherwise specified, all streamflow forecasts are for streamflow volumes that would occur naturally without any upstream influences. Water users need to know what the different forecasts represent if they are to use the information correctly when making operational decisions. The following is an explanation of each of the forecasts.

***Most Probable (50 Percent Chance of Exceeding) Forecast.*** This forecast is the best estimate of streamflow volume that can be produced given current conditions and based on the outcome of similar past situations. There is a 50 percent chance that the streamflow volume will exceed this forecast value. There is a 50 percent chance that the streamflow volume will be less than this forecast value.

The most probable forecast will rarely be exactly right, due to errors resulting from future weather conditions and the forecast equation itself. This does not mean that users should not use the most probable forecast; it means that they need to evaluate existing circumstances and determine the amount of risk they are willing to take by accepting this forecast value.

## To Decrease the Chance of Having Too Little Water

If users want to make sure there is enough water available for their operations, they might determine that a 50 percent chance of the streamflow volume being lower than the most probable forecast is too much risk to take. To reduce the risk of not having enough water available during the forecast period, users can base their operational decisions on one of the forecasts with a greater chance of being exceeded (or possibly some point in-between). These include:

***70 Percent Chance of Exceeding Forecast.*** There is a 70 percent chance that the streamflow volume will exceed this forecast value. There is a 30 percent chance the streamflow volume will be less than this forecast value.

***90 Percent Chance of Exceeding Forecast.*** There is a 90 percent chance that the streamflow volume will exceed this forecast value. There is a 10 percent chance the streamflow volume will be less than this forecast value.

## To Decrease the Chance of Having Too Much Water

If users want to make sure they don't have too much water, they might determine that a 50 percent chance of the streamflow being higher than the most probable forecast is too much of a risk to take. To reduce the risk of having too much water available during the forecast period, users can base their operational decisions on one of the forecasts with a smaller chance of being exceeded. These include:

***30 Percent Chance of Exceeding Forecast.*** There is a 30 percent chance that the streamflow volume will exceed this forecast value. There is a 70 percent chance the streamflow volume will be less than this forecast value.

***10 Percent Chance of Exceeding Forecast.*** There is a 10 percent chance that the streamflow volume will exceed this forecast value. There is a 90 percent chance the streamflow volume will be less than this forecast value.

## Using the forecasts—an example

*Using the Most Probable Forecast.* Using the example forecasts shown below, users can reasonably expect 36,000 acre-feet to flow past the gaging station on the Mary's River near Deeth between March 1 and July 31.

*Using the Higher Exceedance Forecasts.* If users anticipate a somewhat drier trend in the future (monthly and seasonal weather outlooks are available from the National Weather Service every two weeks), or if they are operating at a level where an unexpected shortage of water could cause problems, they might want to plan on receiving only 20,000 acre-feet (from the 70 percent chance of exceeding forecast). In seven out of ten years with similar conditions, streamflow volumes will exceed the 20,000 acre-foot forecast.

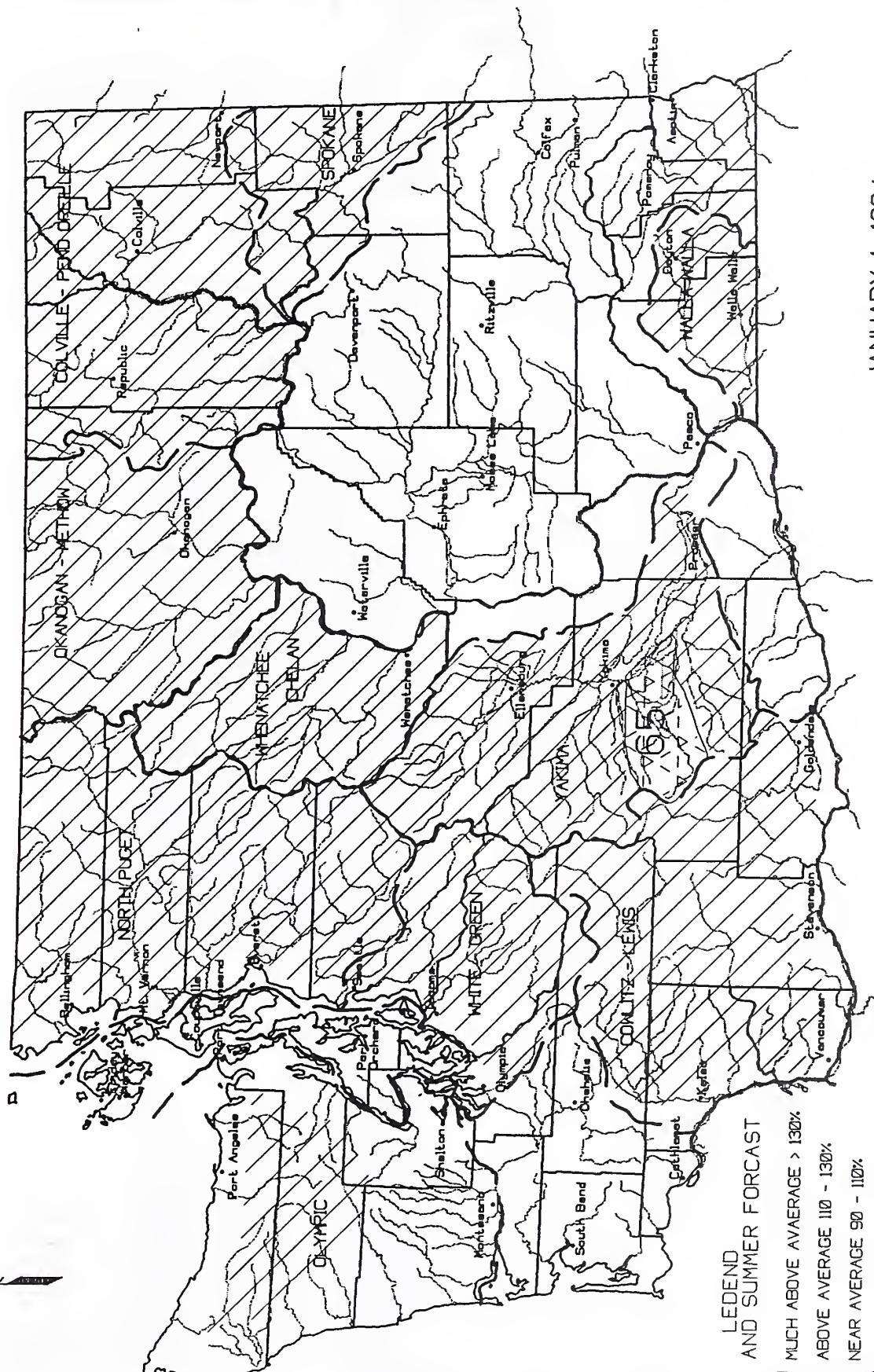
If users anticipate extremely dry conditions for the remainder of the season, or if they determine the risk of using the 70 percent chance of exceeding forecast is too great, then they might plan on receiving only 5000 acre-feet (from the 90 percent chance of exceeding forecast). Nine out of ten years with similar conditions, streamflow volumes will exceed the 5000 acre-foot forecast.

*Using the Lower Exceedance Forecasts.* If users expect wetter future conditions, or if the chance that five out of every ten years with similar conditions would produce streamflow volumes greater than 36,000 acre-feet was more than they would like to risk, they might plan on receiving 52,000 acre-feet (from the 30 percent chance of exceeding forecast) to minimize potential flooding problems. Three out of ten years with similar conditions, streamflows will exceed the 52,000 acre-foot forecast.

In years when users expect extremely wet conditions for the remainder of the season and the threat of severe flooding and downstream damage exists, they might choose to use the 76,000 acre-foot (10 percent chance of exceeding) forecast for their water management operations. Streamflow volumes will exceed this level only one year out of ten.

UPPER HUMBOLDT RIVER BASIN									
STREAMFLOW FORECASTS									
FORECAST POINT	FORECAST PERIOD	FUTURE CONDITIONS							
		90%	70%	50% (Most Probable)	30%	10%	25 YR.		
		(1000AF)	(1000AF)	(1000AF)	(% AVG.)	(1000AF)	(1000AF)	(1000AF)	
MARY'S RIVER nr Deeth	MAR-JUL	5.0	20.0	36	77	52	76	47	
	APR-JUL	8.0	17.0	31	74	45	67	42	
LAMOILLE CREEK nr Lamoille	MAR-JUL	6.0	16.0	24	79	32	43	31	
	APR-JUL	4.0	15.0	22	75	30	41	30	
NF HUMBOLDT RIVER at Devils Gate	MAR-JUL	6.0	12.0	43	73	74	121	59	

For more information concerning streamflow forecasting ask your local SCS field office for a copy of "A Field Office Guide for Interpreting Streamflow Forecasts".



LEGEND  
SPRING AND SUMMER FORECAST

- MUCH ABOVE AVERAGE > 130%
- ABOVE AVERAGE 110 - 130%
- NEAR AVERAGE 90 - 110%
- BELOW AVERAGE 70 - 90%
- MUCH BELOW AVERAGE < 70%
- NOT FORCASTED

WATERSHED BOUNDARY

STREAMFLOW PROSPECTS  
WASHINGTON

JANUARY 1, 1994

U.S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE



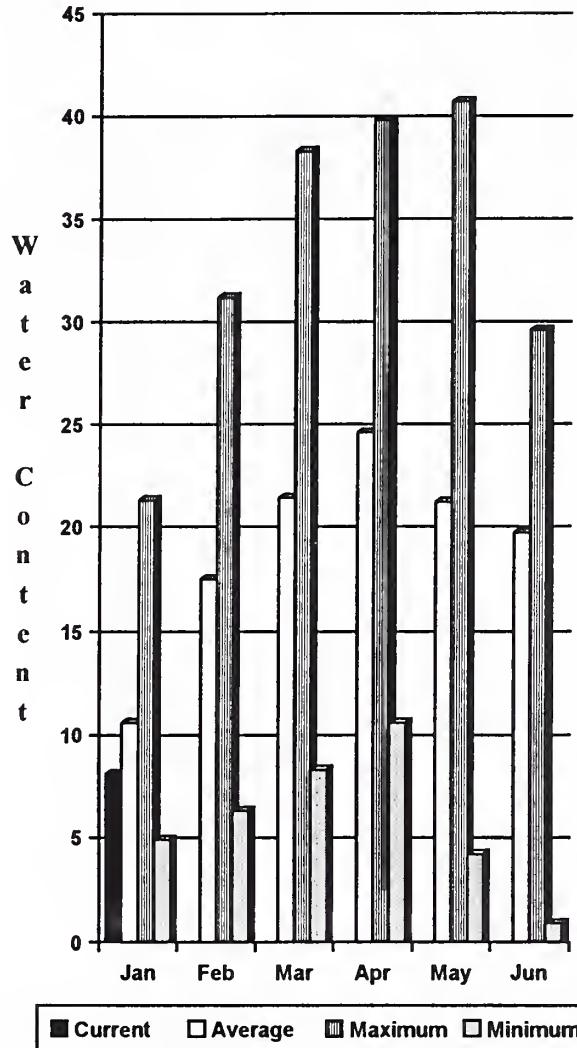
B A S I N S U M M A R Y O F  
S N O W C O U R S E D A T A

JANUARY 1994

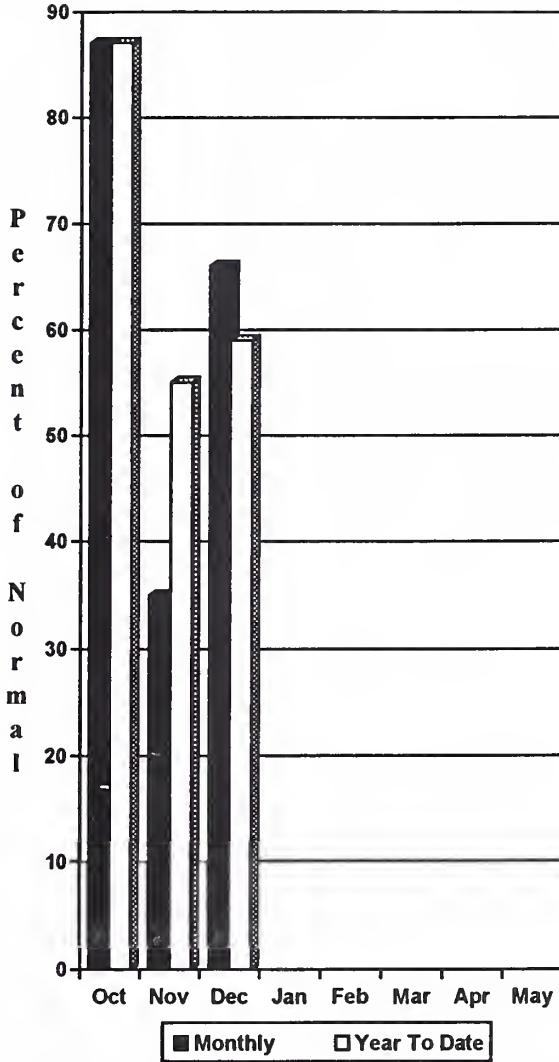
SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90	SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90	
PEND OREILLE RIVER							FISH LAKE	PILLOW	3370	1/01/94	---	13.4S	13.3	12.4
BENTON MEADOW	2370	12/30/93	12	2.8	5.7	2.7	GREEN LAKE	PILLOW	6000	1/01/94	---	7.6S	11.3	9.0
BENTON SPRING	4920	12/30/93	25	7.0	7.0	8.0	GROUSE CAMP	PILLOW	5380	1/01/94	---	7.8S	7.8	8.9
BUNCINGRASS MDW/PILLOW	5000	1/01/94	---	9.5	10.9	10.9	DOMMERIE FLATS	PILLOW	2200	12/28/93	8	2.6	4.3	3.9
HOODOO BASIN	6050	1/01/94	---	12.3E	19.8	20.4	LOST HORSE	PILLOW	5000	1/01/94	---	5.9S	9.7	--
HOODOO CREEK	5900	1/01/94	---	10.8E	17.0	18.0	MORSE LAKE	PILLOW	5400	1/01/94	---	18.3S	21.5	19.1
NELSON	CAN.	3100	12/29/93	24	6.0	6.0	OLALLIE MDWS	PILLOW	3960	1/01/94	---	15.9S	22.4	20.3
KETTLE RIVER							SASSE RIDGE	PILLOW	4200	1/01/94	---	9.9S	17.5	12.4
BARNES CREEK	CAN.	5300	1/05/94	40	9.2	11.1	STAMPEDE PASS	PILLOW	3860	1/01/94	---	10.5S	23.7	16.7
BIG WHITE MTN	CAN.	5510	12/30/93	30	8.0	10.4	TUNNEL AVENUE	PILLOW	2450	12/27/93	16	6.1	7.8	8.1
FARRON	CAN.	4000	1/05/94	31	6.7	5.6	WHITE PASS ES	PILLOW	4500	1/01/94	---	7.5S	11.3	9.8
MONASHEE PASS	CAN.	4500	1/05/94	26	4.9	8.5	AHTANUM CREEK							
COLVILLE RIVER							GREEN LAKE	PILLOW	6000	1/01/94	---	7.6S	11.3	9.0
OMAK LAKE, TWIN LAKES							LOST HORSE	PILLOW	5000	1/01/94	---	5.9S	9.7	--
MOSES MTN	PILLOW	4800	1/01/94	---	4.1S	--	HILL CREEK							
SPOKANE RIVER							HIGH RIDGE	PILLOW	4980	1/01/94	---	5.1S	16.1	9.7
FOURTH OF JULY SUM	3200	12/30/93	13	3.0	8.6	3.4	TOUCHET #2	PILLOW	5530	1/01/94	---	8.5	17.6	12.9
LOST LAKE	(d)	6110	1/01/94	---	13.7E	24.1	LEWIS - COWLITZ RIVERS							
MOSQUITO RDG	PILLOW	5200	1/01/94	---	10.7	14.5	JUNE LAKE	PILLOW	3200	1/01/94	---	13.9S	31.3	11.5
SUNSET	PILLOW	5540	1/01/94	---	8.4	14.7	LONE PINE	PILLOW	3800	1/01/94	---	12.7S	18.0	12.0
NEWMAN LAKE							PARADISE PARK	PILLOW	5500	1/01/94	---	17.3S	31.8	23.6
QUARTZ PEAK	PILLOW	4700	1/01/94	---	10.3	11.4	PIGTAIL PEAK	PILLOW	5900	1/01/94	---	12.9S	20.1	20.1
RAGGED RIDGE		3330	12/29/93	15	3.6	4.9	POTATO HILL	PILLOW	4500	1/01/94	---	7.5S	15.4	10.5
OKANOGAN RIVER							SHEEP CANYON	PILLOW	4050	1/01/94	---	10.1S	25.7	15.2
ENDERBY	CAN.	6200	12/31/93	61	16.9	16.5	SPENCER MDW	PILLOW	3400	1/01/94	---	10.3S	19.9	9.4
GREYBACK RES	CAN.	5120	1/04/94	24	4.5	6.1	SPIRIT LAKE	PILLOW	3100	1/01/94	---	2.4S	13.2	1.8
HAMILTON HILL	CAN.	4890	12/31/93	19	4.7	6.9	SURPRISE LKS	PILLOW	4250	1/01/94	---	14.1S	27.2	20.2
HARTS PASS	PILLOW	6500	1/01/94	---	11.7S	16.5	WHITE PASS ES	PILLOW	4500	1/01/94	---	7.5S	11.3	9.8
ISINTOK LAKE	CAN.	5500	12/28/93	10	2.1	5.3	WHITE RIVER							
MISSEZULA MTN	CAN.	5090	12/31/93	15	3.4	4.2	CORRAL PASS	PILLOW	6000	1/01/94	---	7.6S	16.4	13.5
MISSION CREEK	CAN.	5800	1/04/94	37	9.3	11.5	MORSE LAKE	PILLOW	5400	1/01/94	---	18.3S	21.5	19.1
MONASHEE PASS	CAN.	4500	1/05/94	26	4.9	8.5	GREEN RIVER							
MT. KOBAU	CAN.	5900	12/29/93	14	3.6	6.8	COUGAR MTN.	PILLOW	3200	1/01/94	---	3.5S	14.7	8.3
SALMON MDWS	PILLOW	4500	1/01/94	---	4.2S	5.2	GRASS MOUNTAIN #2	PILLOW	2900	1/03/94	0	.0	--	4.8
SILVER STAR MTN	CAN.	6000	12/27/93	35	10.3	17.0	LESTER CREEK	PILLOW	3100	1/03/94	23	6.6	14.4	8.0
SUMMERLAND RES	CAN.	4200	12/28/93	14	2.8	6.3	LYNN LAKE	PILLOW	4000	1/03/94	0	.0	15.8	7.6
WHITE ROCKS MTN	CAN.	6000	12/29/93	29	8.4	11.6	SAWMILL RIDGE	PILLOW	4700	1/03/94	34	8.7	17.2	13.3
METHOW RIVER							STAMPEDE PASS	PILLOW	3860	1/01/94	---	10.5S	23.7	16.7
HARTS PASS	PILLOW	6500	1/01/94	---	11.7S	16.5	TWIN CAMP	PILLOW	4100	1/03/94	34	7.8	19.3	10.0
SALMON MDWS	PILLOW	4500	1/01/94	---	4.2S	5.2	CEDAR RIVER							
CHELAN LAKE BASIN							MT. GARDNER	PILLOW	2860	1/01/94	---	4.3S	--	--
LYMAN LAKE		5900	1/01/94	---	16.7E	--	TINKHAM CREEK	PILLOW	3000	1/01/94	---	8.4S	--	--
LYMAN LAKE	PILLOW	5900	1/01/94	---	18.0S	23.4	MEADOWS PASS	PILLOW	3240	1/01/94	---	6.2S	--	--
MINERS RIDGE	PILLOW	6200	1/01/94	---	16.4S	20.2	SNOQUALMIE RIVER							
PARK CK RIDGE	PILLOW	4600	1/01/94	---	10.7S	18.0	OLALLIE MDWS	PILLOW	3960	1/01/94	---	15.9S	22.4	20.3
RAINY PASS	PILLOW	4780	1/01/94	---	12.7S	15.5	SKYKOMISH RIVER							
ENTIAT RIVER							STAMPEDE PASS	PILLOW	3860	1/01/94	---	10.5S	23.7	16.7
POPE RIDGE	PILLOW	3540	1/01/94	---	7.1S	7.8	STEVENS PASS	PILLOW	4070	1/01/94	---	8.3S	20.6	15.3
WENATCHEE RIVER							STEVENS PASS SAND SD	PILLOW	3700	12/28/93	34	10.4	15.2	14.6
BERNE-MILL CREEK (d)		3170	12/28/93	31	9.3	12.1	SKAGIT RIVER							
BLEWETT PASS#2	PILLOW	4270	1/01/94	---	6.3S	7.7	HARTS PASS	PILLOW	6500	1/01/94	---	11.7S	16.5	17.9
CHIAWAKUM G.S.		2500	12/28/93	22	4.2	5.0	KLESILKWA	CAN.	3710	1/03/94	8	2.4	5.0	--
FISH LAKE	PILLOW	3370	1/01/94	---	13.4S	13.3	LYMAN LAKE	PILLOW	5900	1/01/94	---	16.7S	--	23.5
LYMAN LAKE		5900	1/01/94	---	16.7E	--	LYMAN LAKE	PILLOW	5900	1/01/94	---	18.0S	23.4	25.4
LYMAN LAKE	PILLOW	5900	1/01/94	---	18.0S	23.4	RAINY PASS	PILLOW	4780	1/01/94	---	12.7S	15.5	15.4
MERRITT		2140	12/28/93	16	4.1	6.5	THUNDER BASIN	PILLOW	4200	1/01/94	---	11.9S	12.0	--
STEVENS PASS	PILLOW	4070	1/01/94	---	8.3S	20.6	BAKER RIVER							
STEVENS PASS		3700	12/28/93	34	10.4	15.2	DOCK BUTTE	AM	3800	12/27/93	46	21.6	--	25.7
TRough #2	PILLOW	5310	1/01/94	---	6.1S	5.0	EASY PASS	AM	5200	12/27/93	50	22.0	--	27.1
UPPER WHEELER	PILLOW	4400	1/01/94	---	5.0S	5.7	JASPER PASS	AM	5400	12/27/93	70	30.1	--	37.9
SQUILCHUCK CREEK							MARTEN LAKE	AM	3600	12/27/93	48	22.6	--	30.1
STEMILT CREEK							MT. BLUM	AM	5800	12/27/93	36	14.4	--	24.4
UPPER WHEELER	PILLOW	4400	1/01/94	---	5.0S	5.7	ROCKY CREEK	AM	2100	12/27/93	15	6.3	--	11.7
COLOCKUM CREEK							SCHREIBERS MDW	AM	3400	12/27/93	36	16.9	--	21.9
TRough #2	PILLOW	5310	1/01/94	---	6.1S	5.0	SF THUNDER CK	AM	2200	12/27/93	0	.0	--	4.5
YAKIMA RIVER							WATSON LAKES	AM	4500	12/27/93	46	18.4	--	24.2
BLEWETT PASS#2	PILLOW	4270	1/01/94	---	6.3S	7.7	ELWHA RIVER							
BUMPING LAKE		3450	12/29/93	16	3.4	--	MORSE CREEK							
BUMPING LAKE (NEW)		3400	12/29/93	19	5.2	--	DUNGENESS RIVER							
BUMPING RIDGE	PILLOW	4600	1/01/94	---	9.2S	11.8	QUILCENE RIVER							
CORRAL PASS	PILLOW	6000	1/01/94	---	7.6S	16.4	MOUNT CRAG	PILLOW	4050	1/01/94	---	11.5S	13.2	--
FISH LAKE		3370	12/28/93	39	12.1	13.9	WYNOCHEE RIVER							

# Spokane River Basin

Mountain Snowpack\* (inches)



Precipitation\* (% of normal)



\*Based on selected stations

The January 1 forecasts for summer runoff within the Spokane River Basin are 77% of normal. The forecast is based on a snowpack that is 77% of average and precipitation that is 59% of normal for the water year. Precipitation for December was 66% of average. Streamflow on the Spokane River was 47% of average for December. January 1 storage in Coeur d'Alene Lake was 60,500 acre feet, 46% of normal, and 25% of capacity. Temperatures in the basin were four degrees above normal during December.

For more information contact your local Soil Conservation Service office.

**SPOKANE RIVER BASIN**  
**Streamflow Forecasts - January 1, 1994**

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		<<---- Drier -----		Chance Of Exceeding *			Wetter ----->>	
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	30% (1000AF)	10% (1000AF)		
SPOKANE near Post Falls	APR-SEP	1240	1720	2040	75	2360	2840	2730
	APR-JUL	1180	1650	1970	75	2290	2760	2633
SPOKANE at Long Lake (2)	APR-JUL			2260	77			2937

**SPOKANE RIVER BASIN**  
**Reservoir Storage (1000 AF) - End of December**

**SPOKANE RIVER BASIN**  
**Watershed Snowpack Analysis - January 1, 1994**

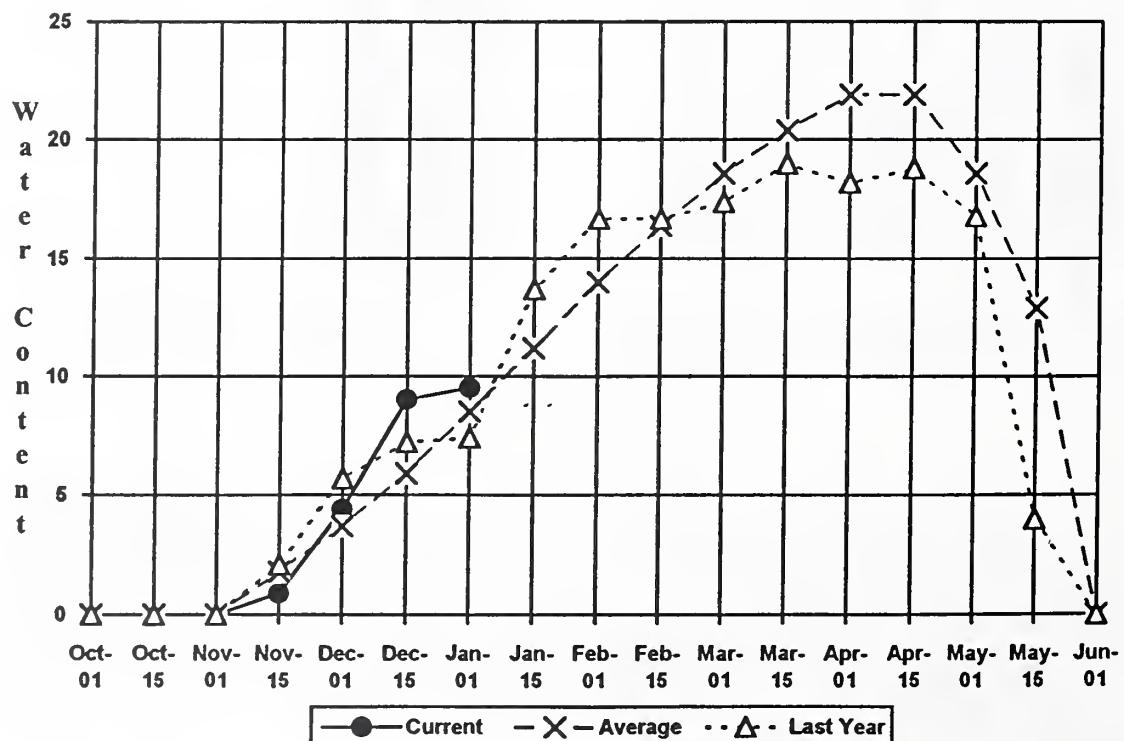
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
COEUR D'ALENE	238.5	60.5	44.5	130.5	Spokane River	5	61	77

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

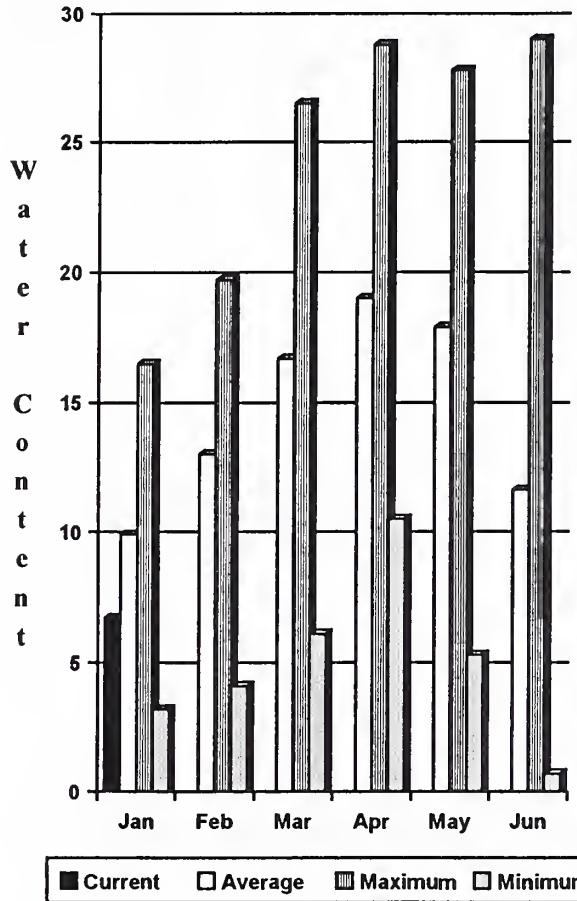
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural flow - actual flow may be affected by upstream water management.

**Quartz Peak SNOTEL**

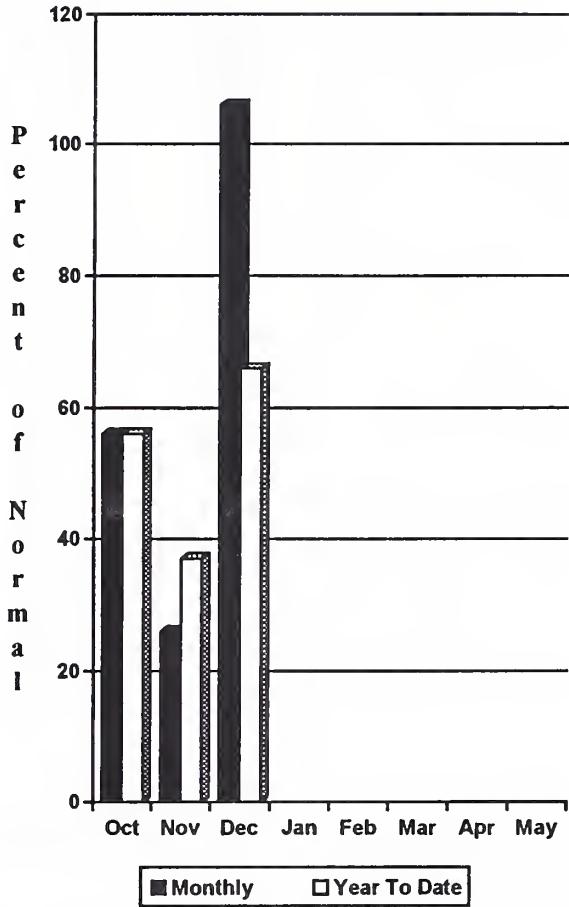


# Colville - Pend Oreille River Basins

Mountain Snowpack\* (inches)



Precipitation\* (% of normal)



\*Based on selected stations

December streamflow was 58% of normal on the Pend Oreille River, 88% on the Columbia at the International Boundary, and 100% on the Kettle River. The forecast for the Kettle River streamflow is for 90% of normal, the Pend Oreille, 70%, and the Colville River, 80% of normal for the summer runoff period. January 1 snow cover was 67% of normal on the Pend Oreille. Snowpack at Bunchgrass Meadow SNOTEL site contained 9.5 inches of water, the average January 1 reading is 10.9 inches. Precipitation during December was 106% of average, bringing the water year-to-date to 66% of normal. Temperatures were five degrees above normal for December.

*For more information contact your local Soil Conservation Service office.*

**COLVILLE - PEND OREILLE RIVER BASINS**  
**Streamflow Forecasts - January 1, 1994**

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)	
		<<---- Drier -----		Chance Of Exceeding *		Wetter ----->>			
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)		
PEND OREILLE bl Box Canyon (1,2)	APR-SEP	5120	8610	10200	70	11800	15300	14590	
	APR-JUL	4700	7910	9360	70	10800	14000	13380	
	APR-JUN	3970	6730	7980	69	9230	12000	11570	
CHAMOKANE CK nr Long Lake	MAY-AUG	0.1	4.1	6.9	73	9.7	13.8	9.4	
COLVILLE at Kettle Falls	APR-SEP	40	79	105	80	131	170	131	
	APR-JUL	38	74	98	82	123	159	120	
	APR-JUN	36	69	91	82	113	146	111	
KETTLE nr Laurier	APR-SEP	820	1330	1670	90	2010	2520	1853	
	APR-JUL	775	1250	1580	90	1910	2390	1760	
	APR-JUN	705	1140	1430	90	1720	2150	1585	
COLUMBIA at Grand Coulee Dm (1,2)	APR-SEP	36600	49100	54800	85	60500	73000	64780	
	APR-JUL	30900	41300	46100	85	50900	61300	54500	
	APR-JUN	24400	32600	36300	85	40000	48200	42730	

COLVILLE - PEND OREILLE RIVER BASINS  
 Reservoir Storage (1000 AF) - End of December

COLVILLE - PEND OREILLE RIVER BASINS  
 Watershed Snowpack Analysis - January 1, 1994

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
ROOSEVELT	5232.0	4447.8	3744.2	4547.9	Colville River	0	0	0
BANKS	715.0	673.5	688.2	618.3	Pend Oreille River	6	73	72
					Kettle River	4	81	90

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

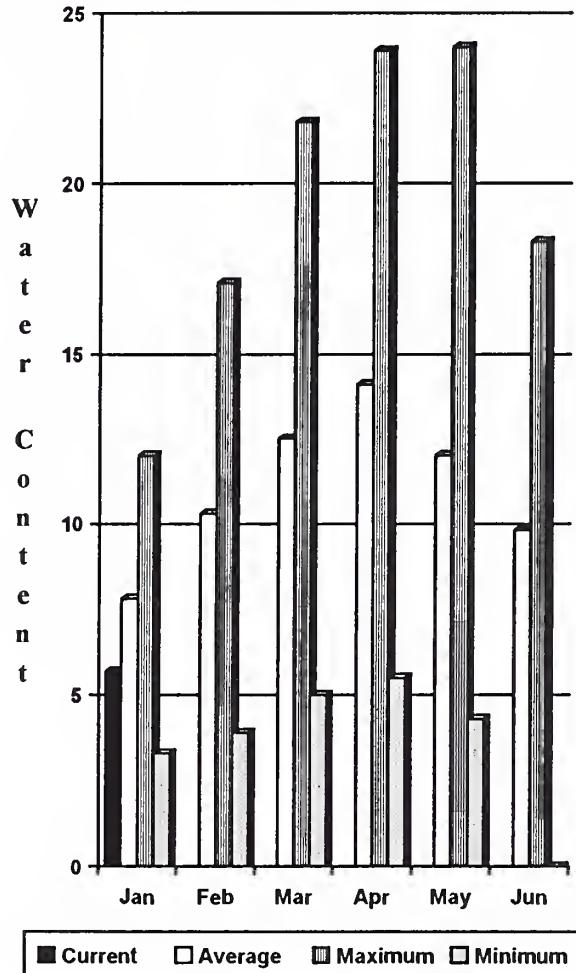
The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

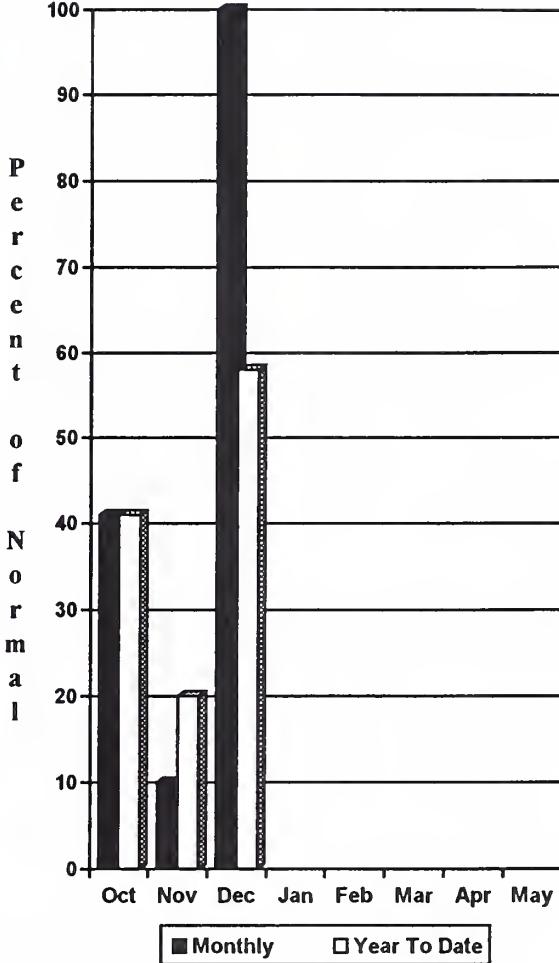
(2) - The value is natural flow - actual flow may be affected by upstream water management.

# Okanogan - Methow River Basins

Mountain Snowpack\* (inches)



Precipitation\* (% of normal)



\*Based on selected stations

Summer runoff forecast for the Okanogan River is 76% of normal; the Similkameen River, 76%, and the Methow River, 78% of normal. January 1 snow cover on the Okanogan and Methow was 73% of normal. December precipitation in the Okanogan - Methow was 100% of normal, with water year-to-date at 58% of average. December streamflow on the Methow River was 69% of normal, 84% on the Okanogan River, and 87% on the Similkameen. Snow water content at the Harts Pass SNOTEL, elevation 6500 feet, was 11.7 inches; normal for this site is 17.9 inches. Temperatures were six degrees above normal for December. Storage in the Conconully Reservoir was 17,300 acre feet, which is 92% of capacity and 129% of January 1 average.

For more information contact your local Soil Conservation Service office.

**OKANOGAN - METHOW RIVER BASINS**  
**Streamflow Forecasts - January 1, 1994**

Forecast Point	Forecast Period	Future Conditions						
		Chance Of Exceeding *			Wetter			
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)	
SIMILKAMEEN nr Nighthawk (1)	APR-SEP	515	910	1090	78	1270	1660	1399
	APR-JUL	510	870	1030	79	1190	1550	1304
	APR-JUN	490	760	880	79	1000	1270	1113
OKANOGAN RIVER nr Tonasket (1)	APR-SEP	485	1000	1230	76	1460	1970	1624
	APR-JUL	480	925	1130	77	1330	1780	1467
	APR-JUN	455	795	950	77	1100	1450	1234
METHOW RIVER nr Pateros (1)	APR-SEP	157	555	735	78	915	1310	942
	APR-JUL	137	510	680	78	850	1220	873
	APR-JUN	126	440	580	78	720	1030	746

**OKANOGAN - METHOW RIVER BASINS**  
**Reservoir Storage (1000 AF) - End of December**      **OKANOGAN - METHOW RIVER BASINS**  
**Watershed Snowpack Analysis - January 1, 1994**

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of Last Yr	This Year as % of Average
		This Year	Last Year	Avg				
CONCONULLY LAKE (SALMON)	10.5	8.4	7.3	7.5	Okanogan River	12	71	78
CONCONULLY RESERVOIR	13.0	8.9	4.6	5.9	Methow River	2	73	73

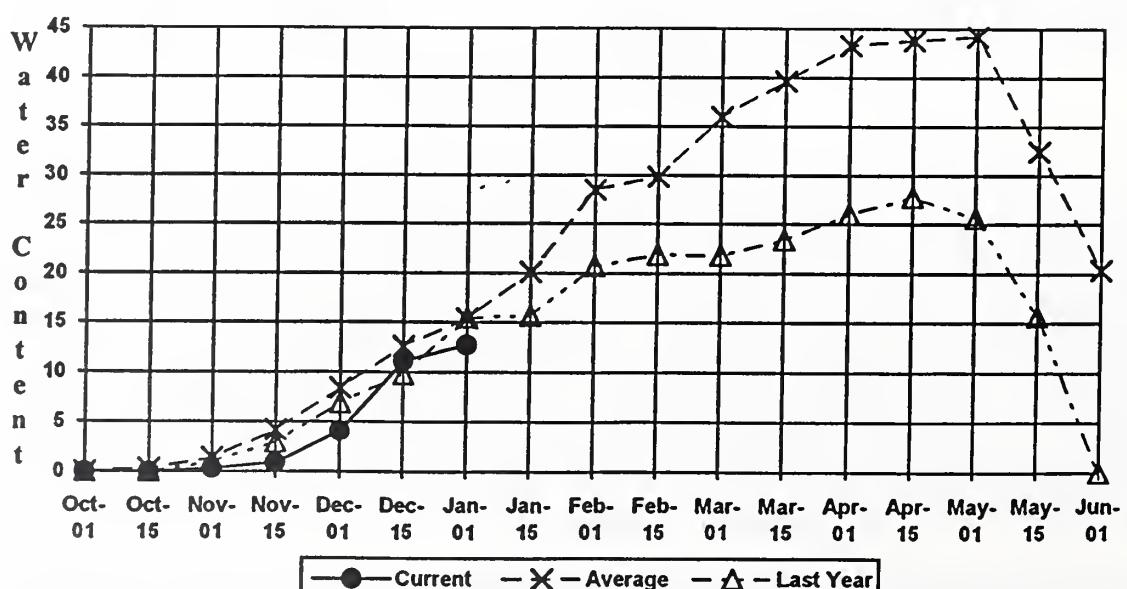
\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

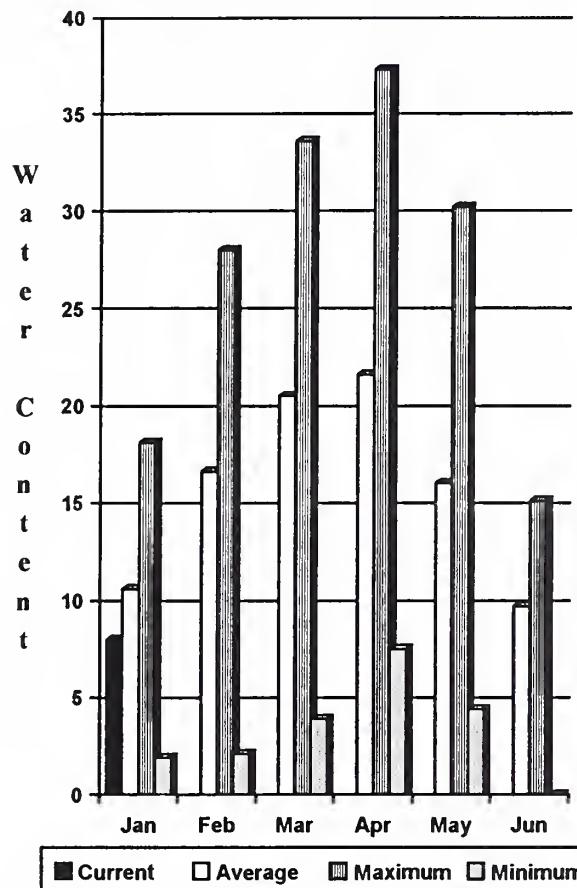
(2) - The value is natural flow - actual flow may be affected by upstream water management.

**Rainy Pass SNOTEL**

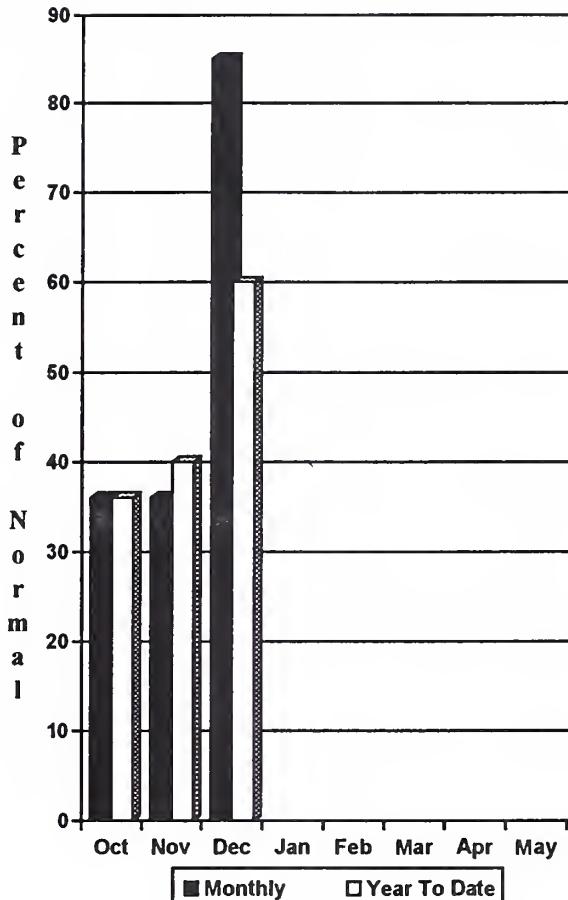


# Wenatchee - Chelan River Basins

Mountain Snowpack\* (inches)



Precipitation\* (% of normal)



\*Based on selected stations

Precipitation during December was 85% of normal in the basin and 60% for the year to date. Runoff for the Entiat River is forecast to be 74% of normal for the summer. The summer forecast for the Chelan River is for 78%, for the Wenatchee River it is 74%, and 80% on the Squilchuck-Stemilt. Icicle Creek can expect below normal runoff this summer. January 1 snowpack in the Wenatchee Basin was 77% of average and the Chelan Basin was 70%. Snowpack along Colockum Ridge and Stemilt Creek was at 85% of normal. Snowpack on the Entiat River was at 78% of average. Reservoir storage in Lake Chelan was 344,700 acre feet or 91% of January 1 average and 51% of capacity. Lyman Lake SNOTEL had the most snow water with 18.0 inches of water. This site would normally have 25.4 inches. Streamflow for December on the Chelan River was 59% of average and on the Wenatchee River it was 31% of normal.

*For more information contact your local Soil Conservation Service office.*

**WENATCHEE - CHELAN RIVER BASINS**  
**Streamflow Forecasts - January 1, 1994**

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)	
		<<----- Drier ----->>		Chance Of Exceeding *		Wetter ----->>			
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(# AVG.)	30% (1000AF)	10% (1000AF)		
CHELAN RIVER at Chelan (1)	APR-SEP	465	765	905	78	1040	1350	1160	
	APR-JUL	420	690	810	79	930	1200	1024	
	APR-JUN	335	545	640	79	735	945	812	
STEHEKIN R. at Stehekin	APR-SEP	440	565	650	79	735	860	827	
	APR-JUL	380	485	555	79	625	730	701	
	APR-JUN	290	370	425	79	480	560	538	
ENTIAT RIVER nr Ardenvoir	APR-SEP	99	140	168	74	196	235	227	
	APR-JUL	89	128	155	75	182	220	206	
	APR-JUN	76	106	127	75	148	178	169	
WENATCHEE R. at Peshastin	APR-SEP	610	965	1210	74	1450	1810	1636	
	APR-JUL	550	870	1090	73	1310	1630	1485	
	APR-JUN	455	715	890	74	1070	1320	1204	
STEMILT nr Wenatchee (miners in)	MAY-SEP	61	90	110	80	130	159	138	
ICICLE CREEK nr Leavenworth	APR-SEP	178	255	310	84	365	440	370	
	APR-JUL	164	235	285	84	335	405	340	
	APR-JUN	131	188	227	84	265	325	270	

**WENATCHEE - CHELAN RIVER BASINS**  
**Reservoir Storage (1000 AF) - End of December**

**WENATCHEE - CHELAN RIVER BASINS**  
**Watershed Snowpack Analysis - January 1, 1994**

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
CHELAN LAKE	676.1	344.7	335.7	378.7	Chelan Lake Basin	3	73	70
					Entiat River	1	91	78
					Wenatchee River	10	74	77
					Squilchuck Creek	0	0	0
					Stemilt Creek	1	88	85
					Colockum Creek	1	122	124

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

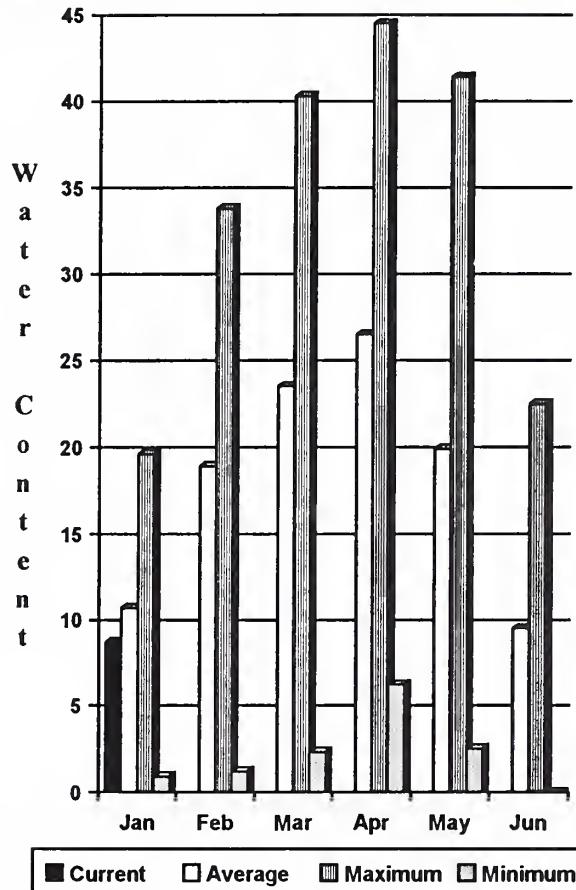
The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

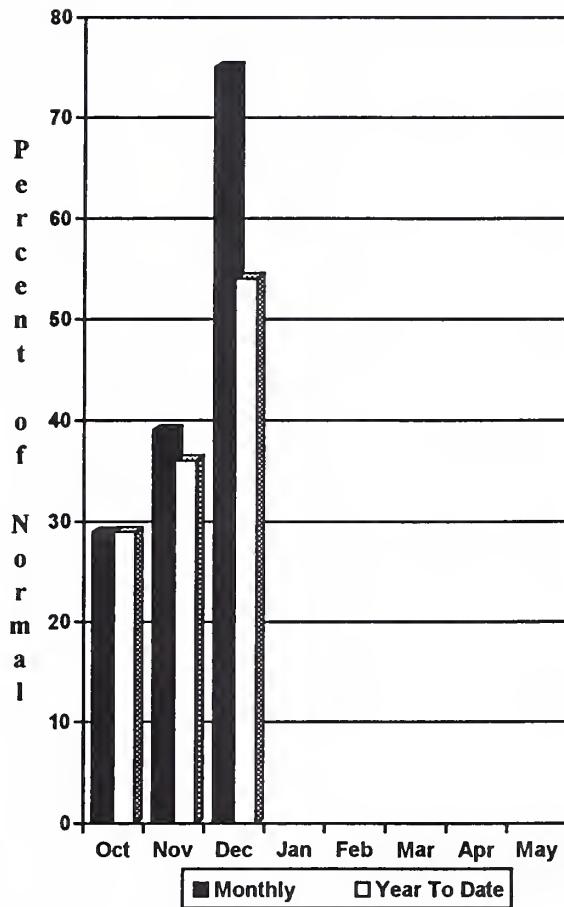
(2) - The value is natural flow - actual flow may be affected by upstream water management.

# Yakima River Basin

Mountain Snowpack\* (inches)



Precipitation\* (% of normal)



\*Based on selected stations

Better start planning for below average runoff for next summer's irrigation season. January 1 reservoir storage for the five major reservoirs was 97,700 acre feet, 17% of average. January 1 summer streamflow forecasts are for below normal in the Yakima Basin. Forecasts for the Yakima River at Cle Elum, 81%; Naches River, 72%; the Yakima River at Parker, 75%, Ahtanum Creek, 65%, and the Tieton River 75%. December streamflows were very low, with the Yakima River at Parker 32% of normal, 36% for the Yakima near Cle Elum, and 24% for the Naches River. January 1 snowpack was 81% based upon 13 snow courses and SNOTEL readings. December precipitation was 75% of normal and 55% for the water year to date. Temperatures were three degrees above average for December. Volume forecasts for the Yakima Basin are for natural flow. As such, they may differ from the U. S. Bureau of Reclamation's forecast for the total water supply available which includes irrigation return flow.

*For more information contact your local Soil Conservation Service office.*

**YAKIMA RIVER BASIN**  
**Streamflow Forecasts - January 1, 1994**

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)	
		<<---- Drier -----		Future Conditions		Wetter ----->>			
		90% (1000AF)	70% (1000AF)	Chance Of Exceeding *	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
KEECHELUS LAKE INFLOW	APR-JUL	67	89	104	84		119	141	124
	APR-SEP	73	97	113	84		129	153	135
	APR-JUN	63	80	92	84		104	122	109
KACHESS LAKE INFLOW	APR-JUL	53	74	89	80		103	124	111
	APR-SEP	56	79	94	80		109	132	118
	APR-JUN	53	70	81	82		92	109	99
CLE ELUM LAKE INFLOW	APR-JUL	225	290	330	81		370	435	409
	APR-SEP	250	320	365	81		410	480	448
	APR-JUN	210	260	290	84		320	370	345
YAKIMA at Cle Elum	APR-JUN	385	495	570	79		645	755	721
	APR-JUL	450	585	675	81		765	900	832
	APR-SEP	500	640	740	81		840	980	915
BUMPING LAKE INFLOW	APR-SEP	62	86	102	75		118	142	136
	APR-JUL	58	79	93	75		107	128	124
	APR-JUN	53	69	80	77		91	108	104
AMERICAN RIVER near Nile	APR-SEP	59	77	90	76		103	121	118
	APR-JUL	55	72	84	77		96	113	109
	APR-JUN	50	64	74	80		84	98	92
RIMROCK LAKE INFLOW	APR-SEP	123	156	178	75		200	235	238
	APR-JUL	102	130	149	75		168	196	200
	APR-JUN	88	110	125	77		140	162	162
NACHES near Naches	APR-SEP	390	515	600	72		685	810	832
	APR-JUL	350	465	545	72		625	740	755
	APR-JUN	320	420	485	75		550	650	651
AHTANUM CREEK nr Tampico (2)	APR-SEP	9.0	22	30	65		39	51	46
	APR-JUL	8.0	20	27	65		35	47	42
	APR-JUN	7.0	17.0	23	65		30	40	36
YAKIMA near Parker	APR-SEP	995	1290	1490	75		1690	1980	1994
	APR-JUL	870	1150	1335	74		1520	1800	1805
	APR-JUN	825	1060	1220	76		1380	1620	1597

YAKIMA RIVER BASIN  
 Reservoir Storage (1000 AF) - End of December

YAKIMA RIVER BASIN  
 Watershed Snowpack Analysis - January 1, 1994

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
KEECHELUS	157.8	22.2	34.8	83.0	Yakima River	13	69	81
KACHESS	239.0	27.5	47.2	159.1	Ahtanum Creek	1	67	84
CLE ELUM	436.9	20.1	56.5	230.2				
BUMPING LAKE	33.7	3.1	4.2	6.3				
RIMROCK	198.0	24.8	44.4	102.1				

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

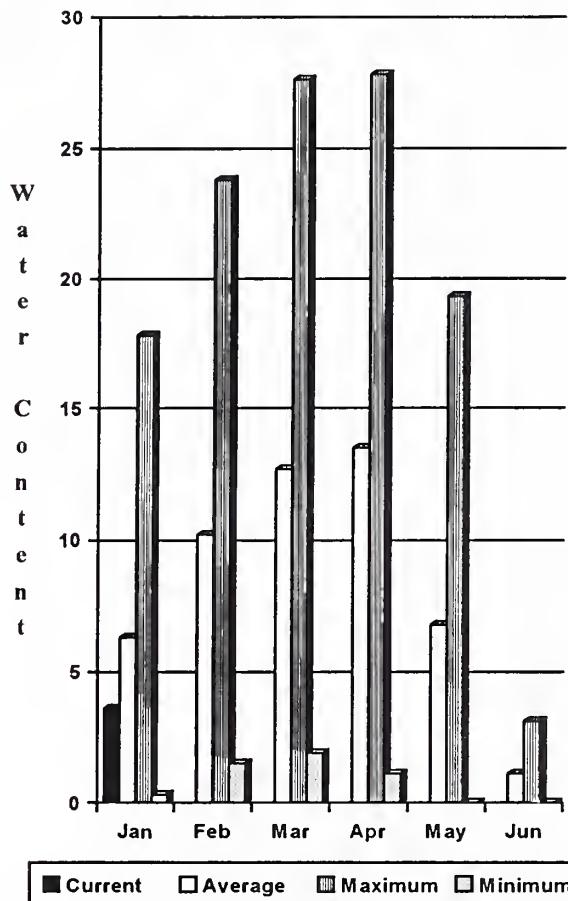
The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

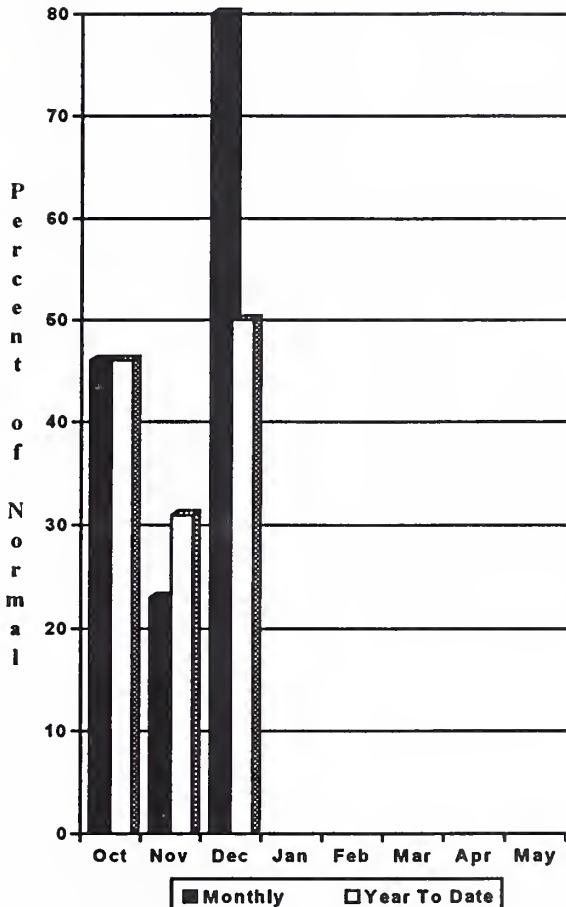
(2) - The value is natural flow - actual flow may be affected by upstream water management.

# Walla Walla River Basin

Mountain Snowpack\* (inches)



Precipitation\* (% of normal)



\*Based on selected stations

The forecast is for 76% of average streamflow in the Walla Walla River for the coming summer, the Grande Ronde, 70%; Snake River, 65%, and 86% for Mill Creek. December streamflow was 32% of normal on the Walla Walla River, 61% for the Snake River, and 44% on the Grande Ronde River near Troy. January 1 snowpack was at 57% of normal. The Touchet SNOTEL site has 7.9 inches of water equivalent, the normal January 1 reading for this site is 12.9 inches. December precipitation was 80% of average, bringing the year-to-date precipitation to 50% of normal. Temperatures were one degree above average for December.

**WALLA WALLA RIVER BASIN**  
**Streamflow Forecasts - January 1, 1994**

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)	
		<<---- Drier ---->>		Chance Of Exceeding *		Wetter			
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	% AVG.	30% (1000AF)	10% (1000AF)		
SNAKE bl Lower Granite Dam (1,2)	APR-JUL	3230	10700	14100	65	17500	25000	21650	
	APR-SEP	3680	12100	15900	65	19700	28100	24360	
MILL CREEK at Walla Walla	APR-SEP	5.0	10.8	14.8	87	18.8	25	17.1	
	APR-JUL	4.8	10.6	14.6	86	18.6	24	16.9	
	APR-JUN	4.8	10.6	14.5	87	18.4	24	16.7	

**WALLA WALLA RIVER BASIN**  
**Reservoir Storage (1000 AF) - End of December**

**WALLA WALLA RIVER BASIN**  
**Watershed Snowpack Analysis - January 1, 1994**

Reservoir	Capacity	Usable   *** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of Last Yr	This Year as % of Average
		This Year	Last Year	Avg				
					Mill Creek	2	40	60

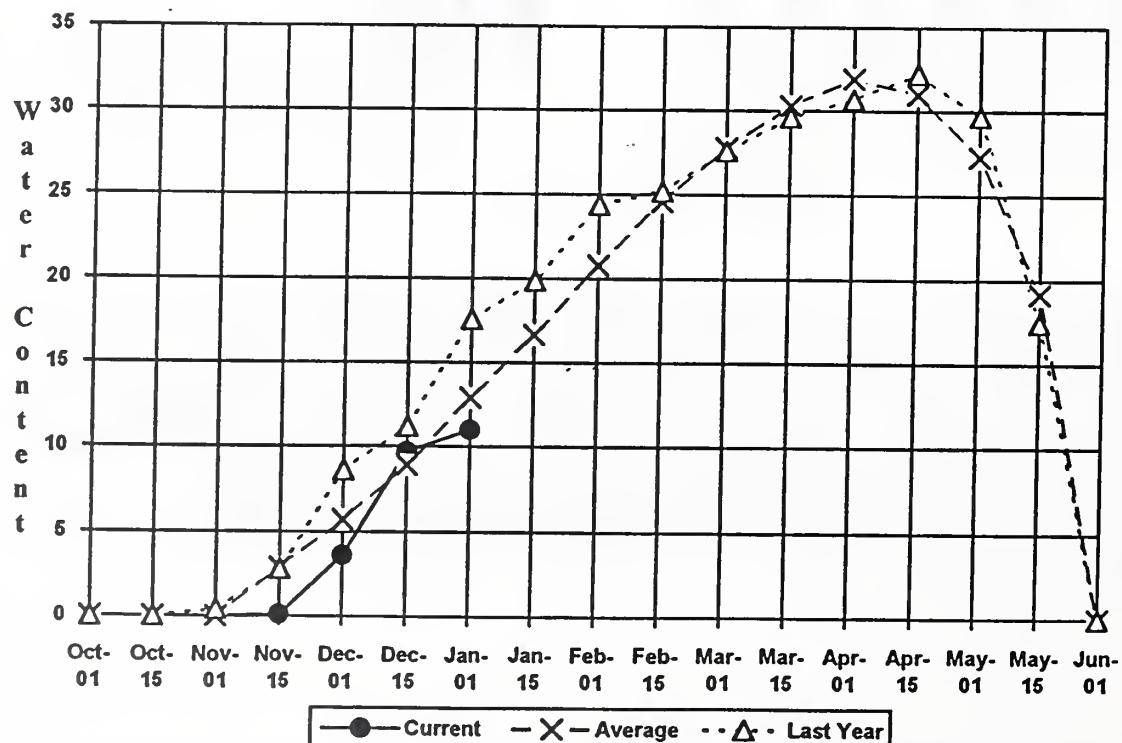
\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

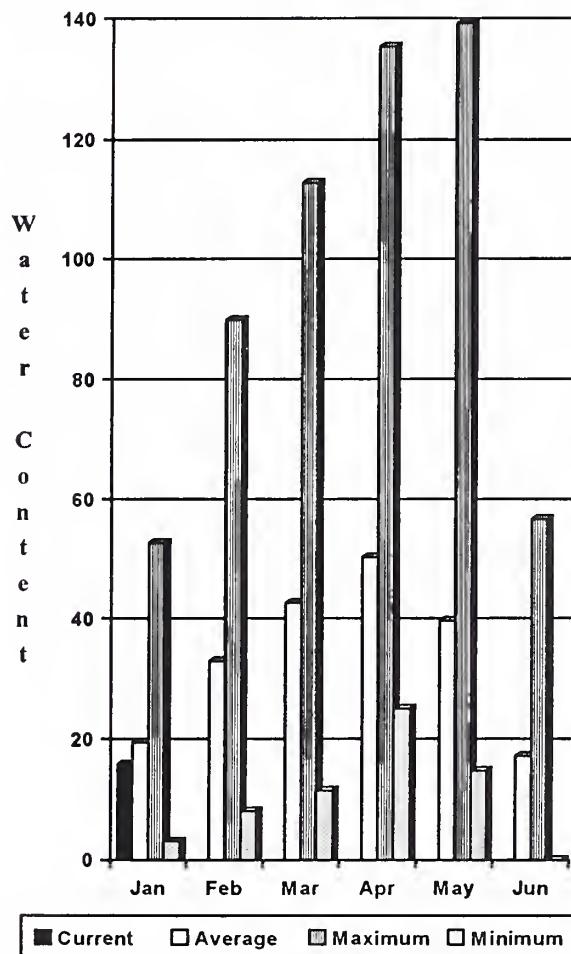
(2) - The value is natural flow - actual flow may be affected by upstream water management.

**Touchet #2 SNOTEL**

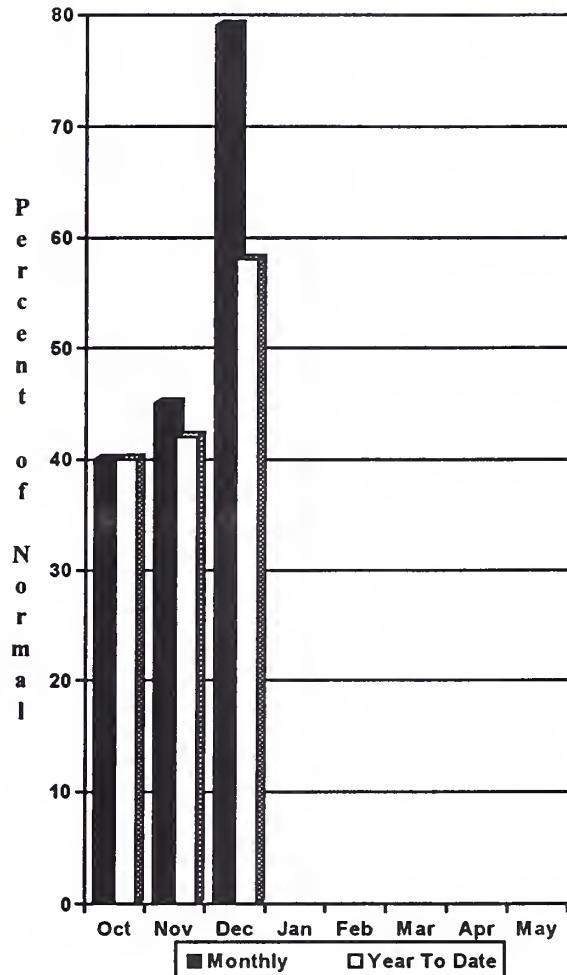


# Cowlitz - Lewis River Basins

Mountain Snowpack\* (inches)



Precipitation\* (% of normal)



\*Based on selected stations

The forecast for summer runoff in the Lewis River is 85% of normal. The Cowlitz River, is forecasted for 83% of normal runoff. December streamflow on the Cowlitz River was 47% of average, and 56% on the Lewis River. December precipitation was 79% of normal, bringing the precipitation to 58% of average for the water year. January 1 snow cover for the Cowlitz River was 71%, and for the Lewis River it was 96%. The Paradise Park SNOTEL contained the maximum water content for the basin with 17.3 inches of water. Normal January 1 water content is 23.6 inches. Temperatures were one degree above normal for December.

**COWLITZ - LEWIS RIVER BASINS**  
**Streamflow Forecasts - January 1, 1994**

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)	
		<<---- Drier -----		Chance Of Exceeding *		Wetter ----->>			
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)		
LEWIS RIVER at Ariel (2)	APR-SEP	500	810	1020	85	1230	1540	1204	
	APR-JUL	445	710	895	85	1080	1350	1051	
	APR-JUN	395	635	795	85	955	1190	933	
COWLITZ R. bl Mayfield Dam (2)	APR-SEP	530	1070	1440	73	1810	2350	1970	
	APR-JUL	465	940	1260	73	1580	2060	1731	
	APR-JUN	415	820	1095	74	1370	1780	1477	
COWLITZ R. at Castle Rock (2)	APR-SEP	1280	1680	1950	73	2220	2620	2667	
	APR-JUL	1120	1460	1700	73	1940	2280	2325	
	APR-JUN	980	1280	1480	74	1680	1980	1995	

**COWLITZ - LEWIS RIVER BASINS**  
**Reservoir Storage (1000 AF) - End of December**

**COWLITZ - LEWIS RIVER BASINS**  
**Watershed Snowpack Analysis - January 1, 1994**

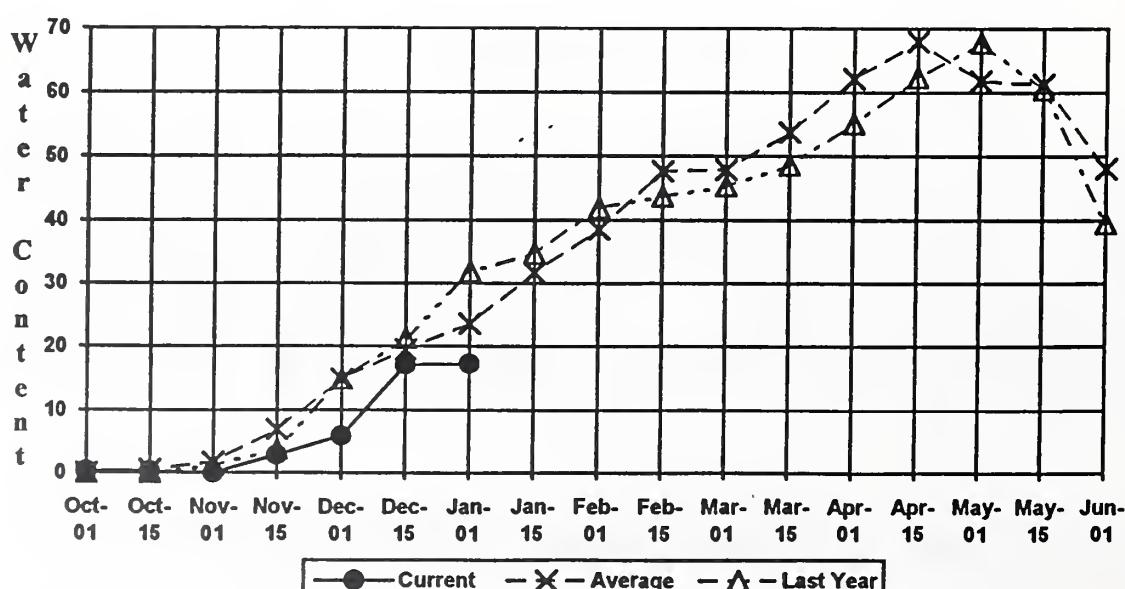
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					Cowlitz River	6	49	71
					Lewis River	4	53	96

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

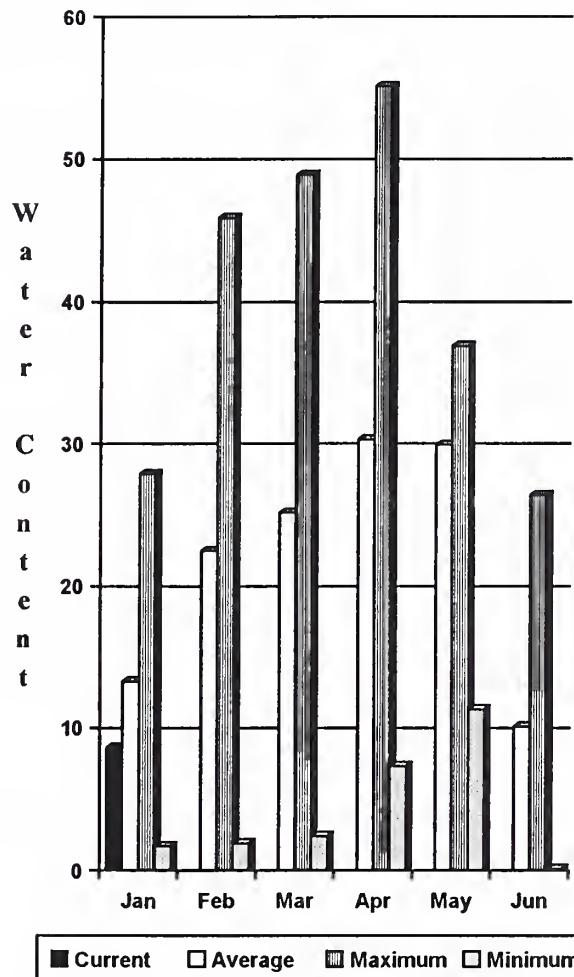
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural flow - actual flow may be affected by upstream water management.

**Paridise SNOTEL**

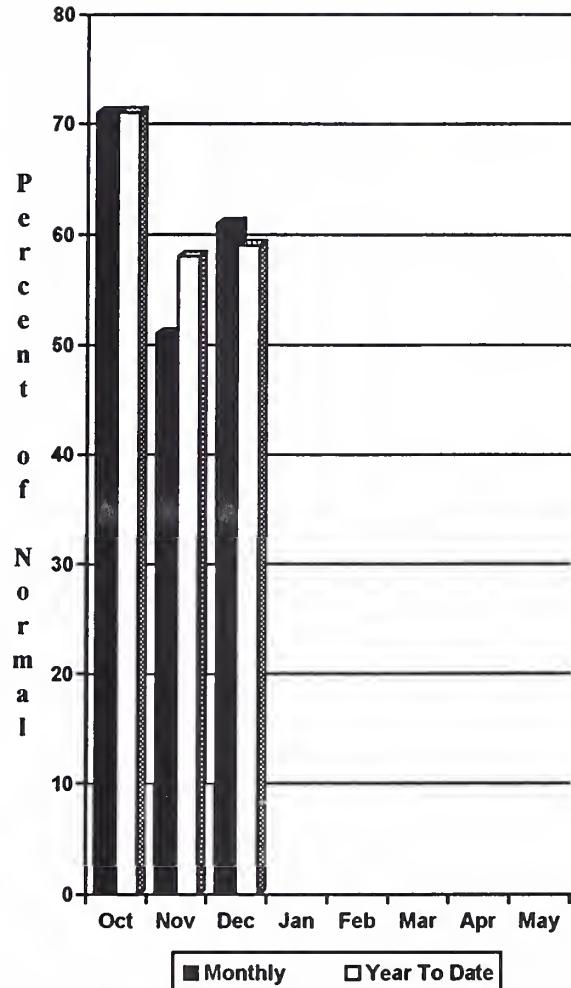


# White - Green River Basins

Mountain Snowpack\* (inches)



Precipitation\* (% of normal)



\*Based on selected stations

Three new SNOTEL sites were established within the Cedar River during the Past summer. These new sites were paid for by the Seattle Water Department. Summer runoff is forecasted to be 75% of normal on the Green River and 82% on the Cedar River, the Rex River at 86%, the South Fork of the Tolt River at 78% and the Cedar River at Cedar, 77%. January 1 snowpack was 79% of normal in the White River Basin and 57% in the Green River Basin. Water content on January 1 at the Stampede Pass SNOTEL, at an elevation of 3860 feet, was 10.5 inches. This site has a January 1 average of 16.7 inches. December precipitation was 61% of normal, bringing the water year-to-date to 59% of average. Temperatures were one degree above average for December.

*For more information contact your local Soil Conservation Service office.*

**WHITE - GREEN RIVER BASINS**  
**Streamflow Forecasts - January 1, 1994**

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)	
		<<---- Drier -----		Chance Of Exceeding *		Wetter ----->>			
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)		
GREEN RIVER below Howard Hanson Dam	APR-JUL	125	167	195	76	225	265	257	
	APR-SEP	131	180	214	75	250	295	285	
	APR-JUN	102	147	178	76	210	255	234	
CEDAR RIVER near Cedar Falls	APR-JUL	34	51	62	81	73	90	77	
	APR-SEP	39	57	70	82	83	101	85	
	APR-JUN	35	48	57	84	66	79	68	
REX RIVER near Cedar Falls	APR-JUL	11.0	18.0	22	81	27	33	27	
	APR-SEP	14.0	21	26	87	31	39	30	
	APR-JUN	12.0	17.0	21	84	25	30	25	
CEDAR RIVER at Cedar Falls	APR-JUL	19.0	46	64	78	82	109	82	
	APR-SEP	16.0	45	64	77	83	112	83	
	APR-JUN	26	48	63	79	78	100	80	
SOUTH FORK TOLT near Index	APR-JUL	7.8	10.0	11.5	76	13.0	15.2	15.2	
	APR-SEP	9.6	12.2	13.9	78	15.6	18.2	17.8	
	APR-JUN	7.2	9.1	10.4	79	11.7	13.6	13.1	

**WHITE - GREEN RIVER BASINS**  
**Reservoir Storage (1000 AF) - End of December**

**WHITE - GREEN RIVER BASINS**  
**Watershed Snowpack Analysis - January 1, 1994**

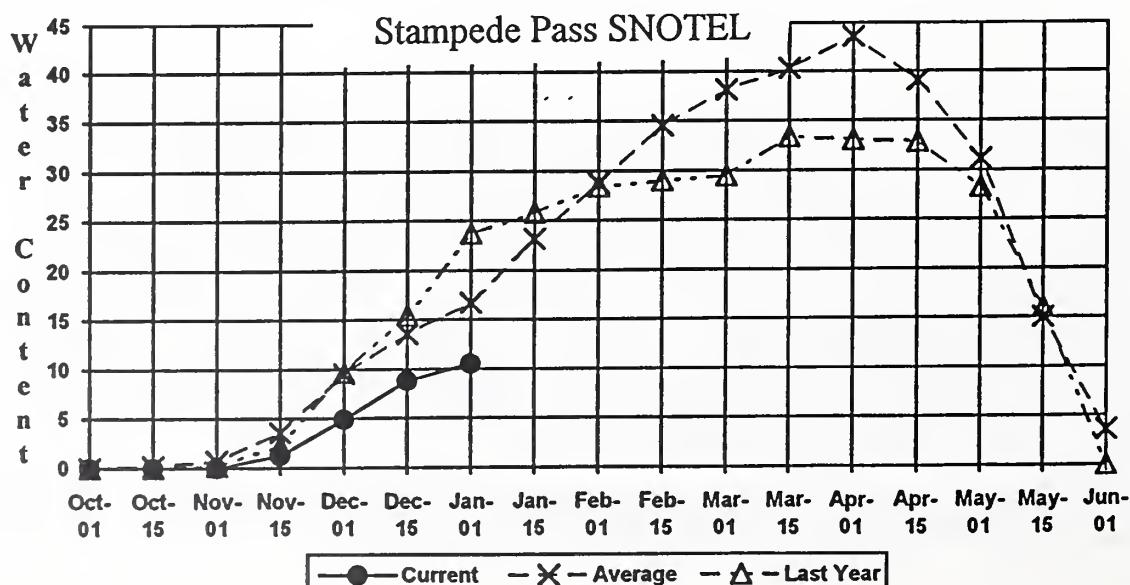
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					White River	2	68	79
					Green River	6	35	58
					Cedar River	0	0	0

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

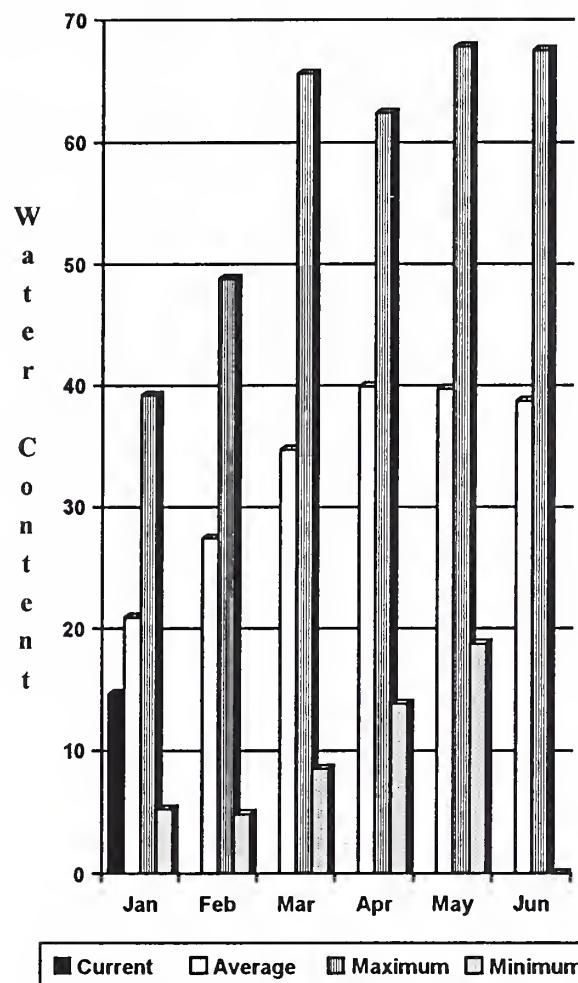
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural flow - actual flow may be affected by upstream water management.

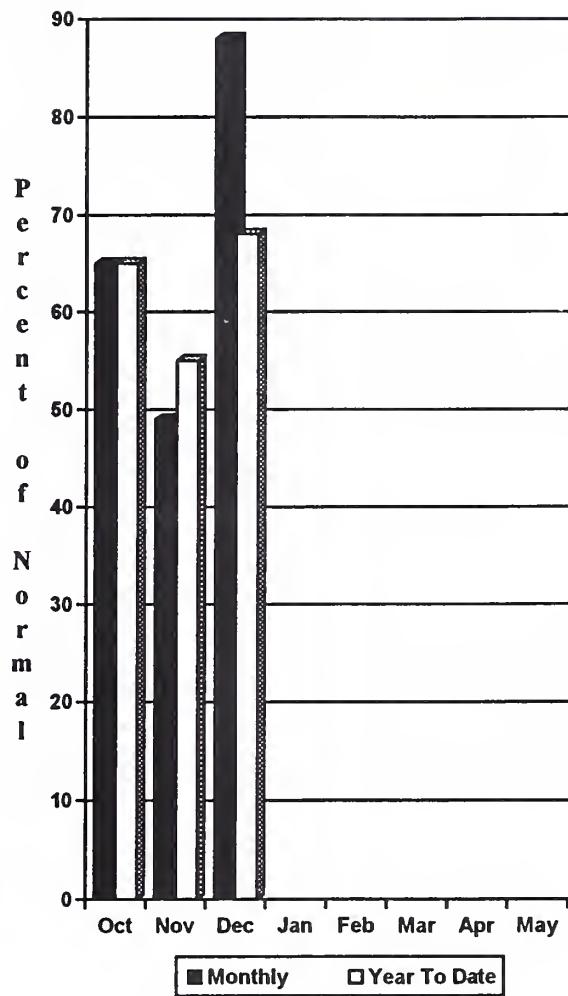


# North Puget Sound River Basins

Mountain Snowpack\* (inches)



Precipitation\* (% of normal)



\*Based on selected stations

December streamflow in the Skagit River was 80% of average. Forecast for the Skagit River streamflow is for 85% of normal for the spring and summer period. Other forecast points include the Baker River at 86% and Thunder Creek at 85%. Precipitation for December was 88% of average with a water year to date at 68% of normal. January 1 snow cover in the Skagit River was 72% of normal. Rainy Pass SNOTEL, at 4780 feet, had 12.7 inches of water content; normal January 1 water content is 15.4 inches. January 1 reservoir storage was above average, with Ross Lake at 134% normal and 75% of capacity. December temperatures were two degrees above normal.

*For more information contact your local Soil Conservation Service office.*

**NORTH PUGET SOUND RIVER BASINS**  
**Streamflow Forecasts - January 1, 1994**

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	% AVG.	30% (1000AF)	10% (1000AF)	
THUNDER CREEK near Newhalem	APR-JUL	166	185	198	86	210	230	230
	APR-SEP	240	265	279	85	295	320	328
	APR-JUN	98	116	128	86	140	158	149
SKAGIT RIVER at Newhalem (2)	APR-SEP	1280	1620	1860	85	2100	2440	2185
	APR-JUL	1070	1360	1560	85	1760	2050	1830
	APR-JUN	840	1060	1210	86	1360	1580	1410
BAKER RIVER near Concrete	APR-JUL	560	660	727	87	795	895	836
	APR-SEP	730	840	915	86	990	1100	1064
	APR-JUN	405	480	535	88	590	665	611

**NORTH PUGET SOUND RIVER BASINS**  
**Reservoir Storage (1000 AF) - End of December**

**NORTH PUGET SOUND RIVER BASINS**  
**Watershed Snowpack Analysis - January 1, 1994**

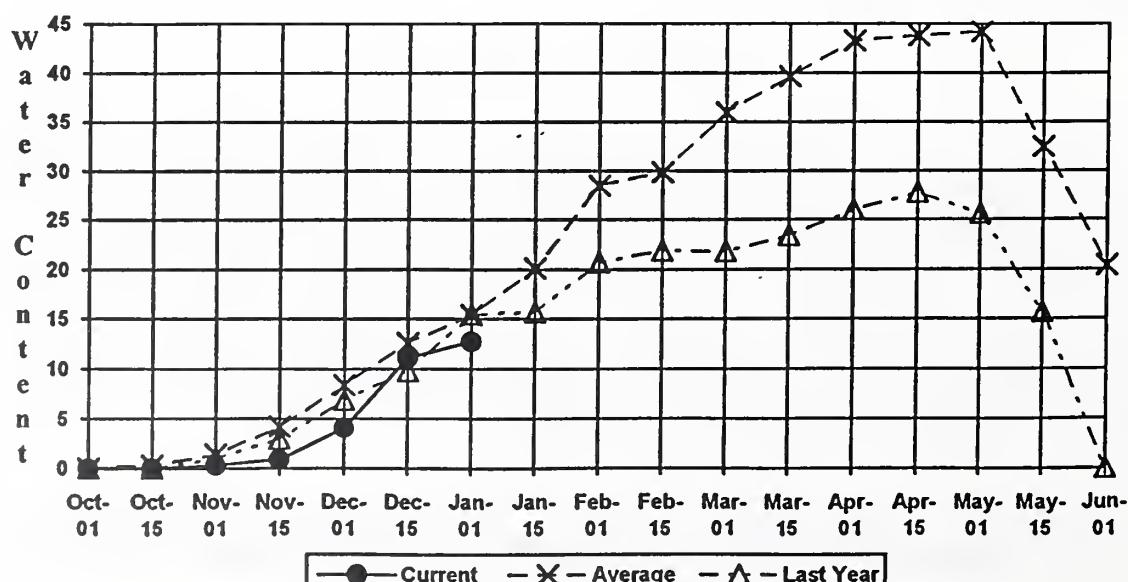
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as of	
		This Year	Last Year	Avg			Last Yr	Average
ROSS	1404.1	1052.2	681.8	783.9	Snohomish River	4	55	67
DIABLO RESERVOIR	90.6	87.3	85.6	---	Skagit River	3	77	72
GORGE RESERVOIR	9.8	8.0	8.0	---	Baker River	0	0	0

\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

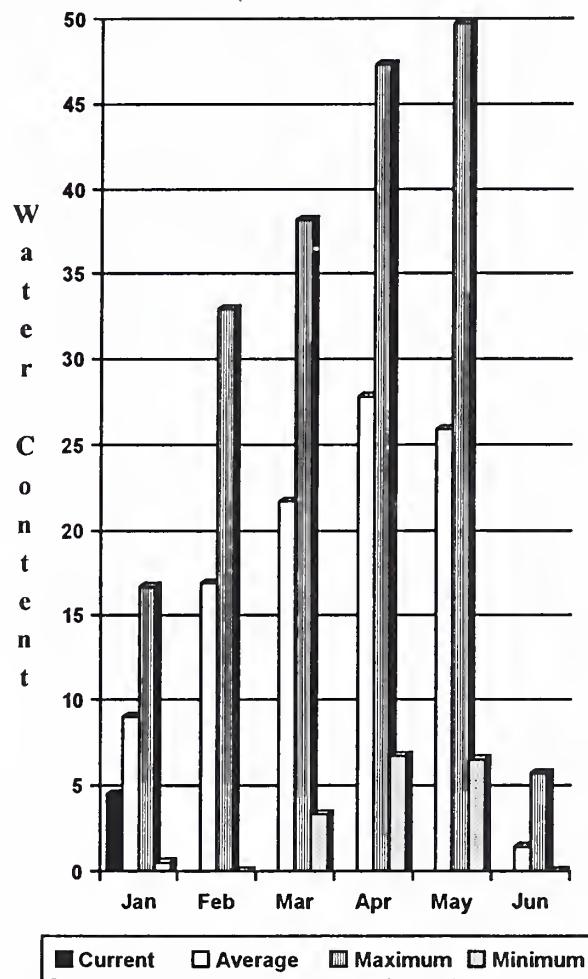
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
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**Rainy Pass SNOTEL**

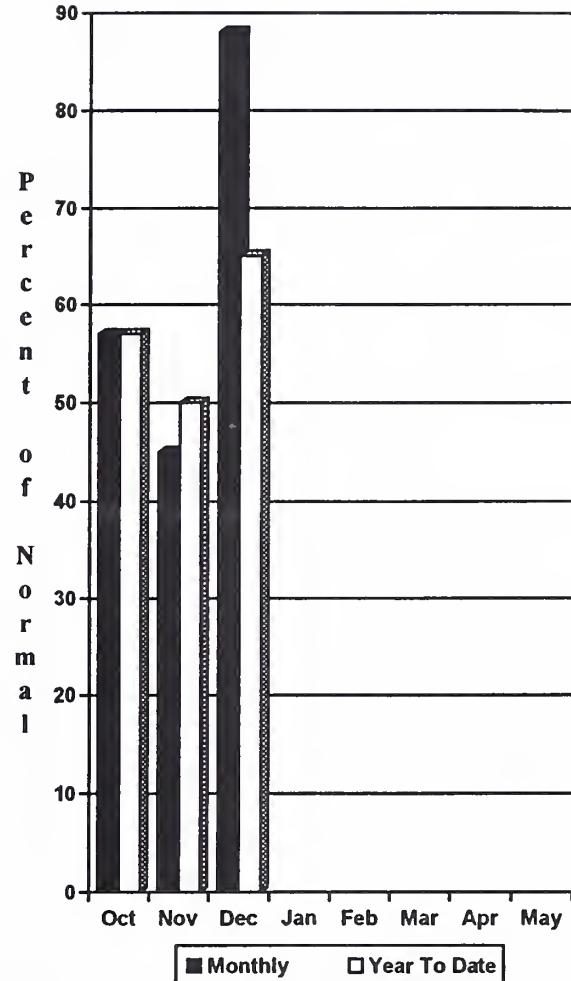


# Olympic Peninsula River Basins

Mountain Snowpack\* (inches)



Precipitation\* (% of normal)



\*Based on selected stations

January forecasts of runoff for streamflow in the basin are for 84% of average on the Dungeness River and the Elwha River, 89%. The Big Quilcene can expect below normal runoff this summer. December precipitation was 88% of average. Precipitation has accumulated at 65% of normal for the water year. December precipitation at Quillayute was 12.85 inches. January 1 snow cover in the Olympic Basin is estimated to be below normal. Snow course measurements will begin in February. The Mount Crag SNOTEL near Quilcene had 11.5 inches on January 1, last year it had 13.2 inches. Temperatures were one degree above normal for December.

*For more information contact your local Soil Conservation Service office.*

**OLYMPIC PENINSULA RIVER BASINS**  
**Streamflow Forecasts - January 1, 1994**

Forecast Point	Forecast Period	Future Conditions						30-Yr Avg. (1000AF)	
		<<---- Drier -----		Chance Of Exceeding *		Wetter ----->>			
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(Avg.)	30% (1000AF)	10% (1000AF)		
DUNGENESS RIVER nr Sequim	APR-SEP	102	121	134	84	147	166	160	
	APR-JUL	87	103	113	86	123	139	131	
	APR-JUN	65	76	84	86	92	103	98	
ELWHA RIVER nr Port Angeles	APR-SEP	335	400	445	89	490	555	502	
	APR-JUL	280	335	371	89	410	460	417	

**OLYMPIC PENINSULA RIVER BASINS**  
**Reservoir Storage (1000 AF) - End of December**

**OLYMPIC PENINSULA RIVER BASINS**  
**Watershed Snowpack Analysis - January 1, 1994**

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of		
		This Year	Last Year	Avg			Last Yr	Average	
					Elwha River	0	0	0	0
					Morse Creek	0	0	0	0
					Dungeness River	0	0	0	0
					Quilcene River	0	0	0	0
					Wynoochee River	0	0	0	0

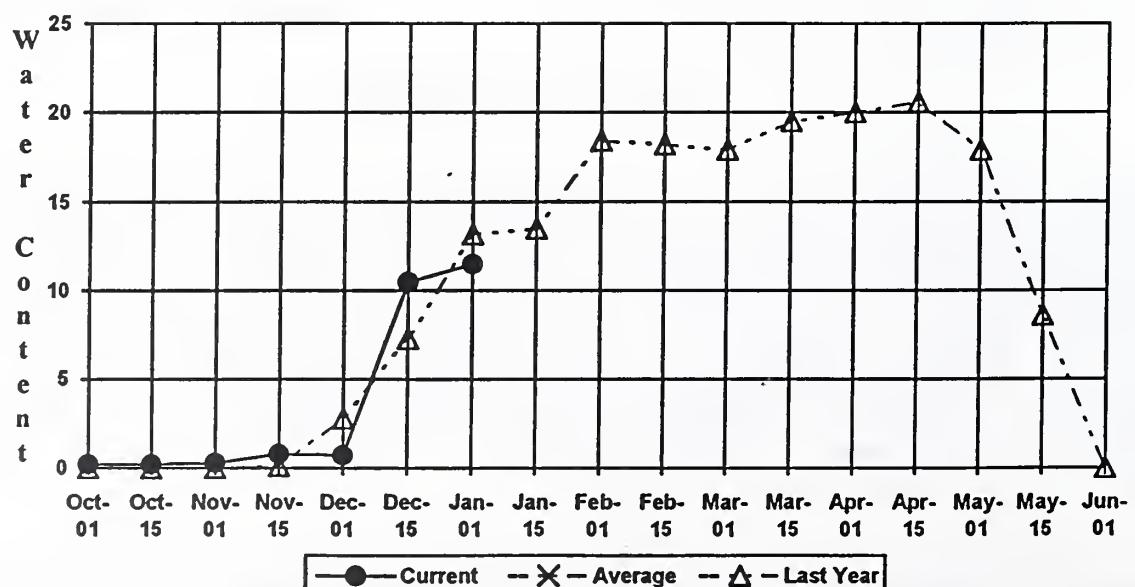
\* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.

(2) - The value is natural flow - actual flow may be affected by upstream water management.

**Mount Crag SNOTEL**



\* No average snow pack is available for Mount Crag at this time.

In addition to basin outlook reports, a Water Supply Forecast for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 248, Portland, OR 97209-3489.

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Issued by *Released by*

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## The Following Organizations Cooperate With the Soil Conservation Service in Snow Survey Work\*:

<b>Canada</b>	Ministry of the Environment Investigations Branch, Victoria, British Columbia
<b>Federal</b>	Washington State Department of Ecology Washington State Department of Natural Resources
<b>State</b>	Department of the Army Corps of Engineers U.S. Department of Agriculture Forest Service U.S. Department of Commerce NOAA, National Weather Service U.S. Department of Interior Bonneville Power Administration Bureau of Reclamation Geological Survey National Park Service Bureau of Indian Affairs
<b>Local</b>	City of Tacoma City of Seattle Chelan County P.U.D. Pacific Power and Light Company Puget Sound Power and Light Company Washington Water Power Company Snohomish County P.U.D. Colville Confederated Tribes Spokane County Yakima Indian Nation
<b>Private</b>	Okanogan Irrigation District Wenatchee Heights Irrigation District Newman Lake Homeowners Association

\*Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.



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